



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,639	08/16/2006	Toshio Isozaki	294568US0PCT	2292
22850	7590	08/10/2009		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
LACLAIR, DARCY D				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
08/10/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdoCKET@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

Office Action Summary

Application No.

10/589,639

Applicant(s)

ISOZAKI ET AL.

Examiner

Darcy D. LaClair

Art Unit

1796

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7, 8 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-4, 7, 8 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **7/21/2009** has been entered.

All outstanding rejections, except for those maintained below are withdrawn in light of the amendment filed on **7/21/2009**.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Support for the amendment to **Claim 1**, from which all claims depend is noted in the limitations of Claims 5 and 9 (1 to 20 mass parts of inorganic filler) and Claims 6 and 10 (1 to 15 parts of impact resistance improver), the type of inorganic filler (talc) is supported at paragraph [0025]) and the type of impact resistance improver (core-shell elastomer) is supported at paragraph [0026]). Inclusion of a limitation requiring PTFE in an amount of 0.1 to 2 mass parts is supported at paragraphs [0034] and [0035]).

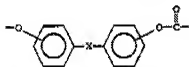
Claim Rejections - 35 USC § 103

2. **Claims 1-3, 7-8 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Laughner et al. (US 5,369,154)** in view of **Laughner et al. (US 4,786,686)** and **Meyer et al. (US 2004/0030090)**.

With regard to Claim 1, Laughner 154 teaches a polycarbonate blend of good impact and flexural strength, which consists of component (a), from about 5 percent to about 95% of polycarbonate (consistent with A-1, A-2) which can be composed of an aromatic dihydric phenol with a carbonate precursor, or other polycarbonates, as well as (e) a rubber modified styrene/acrylonitrile copolymer up to 50% (consistent with B). (See col 2 line 35-50)

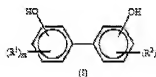
With regard to applicant's A-1, or Laughner 154's (a), Laughner 154 teaches a polycarbonate composed of a dihydric phenol and a carbonate precursor. As the dihydric phenol, Laughner 154 teaches the preferred general formula (I), shown below on the left, next to applicant's formula (right)

A preferred aromatic polycarbonate is characterized by repeated units corresponding to the general formula:



wherein X is a divalent, linear or cyclic C₁-C₁₅ hydrocarbon radical, a single bond, -O-, -S-, -S₂-, -SO-, -SO₂-, or -CO-. Each aromatic ring may additionally contain, instead of hydrogen, up to four substituents such as C₁-C₄ alkyl hydrocarbon or alkoxy radicals, aryl or aryloxy radicals, or halo radicals.

(Laughner 154, col 4)



[Formula 1]

[0045] (wherein R¹ and R² represent independently a group selected from a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 5 to 7 carbon atoms, a substituted or unsubstituted aryl group having 6 to 12 carbon atoms and halogen atoms; m and n are each an integer of 1 to 4).

(Applicant's p. 9-10 Formula I)

For Laughner 154's compound, where X is a single bond and one of the hydrogens on each ring in Laughner 154's formula is substituted, (as Laughner 154 indicates in the text accompanying the formula, col 4 line 47-53), this formula is consistent with applicant's Formula I, once in the polymer chain. Applicant's formula displays "-OH" groups, where -O- groups are shown in Laughner 154's work. This merely reflects whether the structure is shown before or after being reacted with the carbonate precursor to generate a polycarbonate compound. This compound taught by Laughner 154 constitutes a dihydroxybiphenyl used as the raw material in generating an aromatic polycarbonate resin, and therefore meets applicant's limitation with respect to (A-1). With regard to applicant's A-2, the examiner takes the position that as it requires 90% to 100% mass, the presence of this component is optional, and therefore not required to meet the limitations with respect to Claim 1.

With regard to applicant's (B) amorphous styrene, or Laughner's (e), Laughner 154 teaches several olefinic polymers which can contain a vinylic group (styrene) in combination with the polycarbonate. These include both styrene in combination with rubbers and without. Most similar to those compounds disclosed in applicant's specification is component (e), which is a styrene/acrylonitrile copolymer (SAN), or a rubber modified SAN copolymer, such as acrylonitrile-butadiene-styrene copolymer (ABS). (See col 11 line 35-42) The incorporation of a comonomer with styrene typically reduces the crystallinity of the styrene. Additionally, applicant's amorphous styrene is described in the specification as being ABS or other rubber modified styrene

copolymers. (Applicant's p. 11 par [0024]) An ABS copolymer therefore meets applicant's requirement for an amorphous styrene.

With regard to the other additives, Laughner 154 teaches that fillers such as talc, clay, or mica can be used (col 16 line 63-65), and constitute up to 40% of the composition. (col 17 line 1-4) Laughner 154 also teaches component (f), a core-shell graft polymer, (col 15-16) as an impact modifier in an amount up to 25%, (col 2 line 50-57) and exemplifies using 60 parts of the core-shell elastomer per 1840 parts of the polycarbonate and styrene portions, (See col 19, Table V, Example 17) or 3.2 parts per 100 of the core shell elastomer. These teachings encompass the ranges required by applicant, and the exemplified content of the core-shell elastomer anticipates the range claimed by applicant.

Laughner '154 teaches that additives can be included improve the ignition resistance of the composition (See col 16 line 64), and suggests that these additives which are known in the art, typically do not exceed 5% by weight of the composition (See col 17 line 2). Laughner '154 does not explicitly teach the addition of PTFE to the composition. Other work by the same inventor, Laughner '686, in the same art, namely improving the quality of polycarbonate (or carbonate polymers compositions), teaches the incorporation of a fluorine containing polymer (see abstract) such as polytetrafluoroethylene. (See col 4, line 12) Laughner '686 exemplifies a content of 0.1 to 5 percent by weight (see col 5 line 59), and exemplifies a content of 0.2 and 0.3 parts by weight, with 100 or 200 parts by weight of the polycarbonate. (See col 6, col 7, Table I) In both cases, the same inventor working in the same system presents

polycarbonate compositions. The more recent art, Laughner '154, presents improvements to the polycarbonate composition, and glosses over the trivial additives, such as flame retardants, which are well known and well established in the art. The inventors own work, Laughner '686, from six years prior, presents these flame retardants, in a similar system (a polycarbonate in combination with a SAN copolymer and a impact modifier) (See abs). It would have been obvious, not only for one of ordinary skill in the art, but for this specific practitioner, to have made the combination of these well know elements with the improvements of the composition described in Laughner '154.

Laughner '154 teaches a dihydroxybiphenyl, compound, and indicates that the compound of formula I can be employed as a copolymer of two or more bisphenols in combination with acid or hydroxyl terminated reactants. (See col 4 line 37-65) The disclosure does not specify the content of the dihydroxybiphenyl monomer in the polycarbonate resin. Meyer teaches polycarbonates with special terminal groups, and processes for producing such resins. (See abstract) These resins are composed of phenolic compounds including diphenols such as dihydroxybiphenyls, (see par [0078]), with 4,4'-dihydroxybiphenyl (DOD) as a preferred diphenol (see par [0079]). Meyer exemplifies as a co-polycarbonate which contains 0.14 mole of bisphenol A, 0.06 mole of dihydroxybiphenyl, 0.223 mole of diphenyl carbonate, 0.0028 mole of additional compounds. (See Example 11, par [0192]-[0193]) This is a total of 0.4258 moles; with 0.06 moles of dihydroxybiphenyl, Meyer's compound contains 14.1 mol% of dihydroxybiphenyl, which is within applicant's claimed range. Meyer teaches that these

polycarbonates do not exhibit high zero sheer viscosity or undergo degradation under thermal stress such as extrusion or injection molding (see par [0018]) and can be mixed with other thermoplastics, and processed into molded articles or extrudates. (See par [0117]) They are particularly applicable for safety panels for vehicles and aircraft, production of fibres and threads, production of molded articles and precision injection molded parts, production of optical instrument parts, mobile telephone housings, applications in the automobile sector. (See par [0119]-[0148]) This is consistent with Laughner 154's use of the polycarbonate, which includes films, fibers, extruded sheets, molded or shaped articles, especially appliance and instrument housings, automobile body panels, and components for the automotive and electronic industry. (See col 2 line 10-19) Furthermore, it would be obvious for Laughner 154 to employ the polycarbonate of Meyer in order to enjoy the benefit of the decreased viscosity which would improve the processing and injectibility of the resin, as well as the improved thermal stress resistance, which would allow the composition to be processed via injection molding or extrusion with less risk of degradation.

With regard to Claim 2, Laughner '154 teaches the styrene/acrylonitrile copolymer is a rubber modified SAN, for example, an acrylonitrile-butadiene-styrene copolymer (ABS). (See col 11 line 40) The composite can be manufactured from nothing other than acrylonitrile, butadiene, and styrene, (see col 11 line 57-58) or can include other monomers, such as methacrylonitrile, methyl methacrylate, ethyl methacrylate, and others. (See col 12, line 25-55) ABS is consistent with the

requirements of the claim, and the other monomers used in concert would yield such styrene resins as MBS and MS.

With regard to Claim 3, Laughner 154 teaches that carbonate copolymers can be formed when a bisphenol is reacted with a carbonic acid derivative and a **polydiorganosiloxane** to yield a siloxane/carbonate block copolymer. (col 4 line 66- col 5 line 2) This would generate an additional polycarbonate compound not the resin of (A-1), and Laughner 154 teaches that the various polycarbonates presented can be used as blends. (col 5 line 21-25) This teaches the siloxane/carbonate block copolymer containing polydiorganosiloxane used in combination with the other polycarbonate resin, and teaches a combination that is consistent with the combination required by applicant. With regard to the content of each, applicant requires 10 to 100 mass% of the polycarbonate (A-1), and 0 to 90 mass% of the polycarbonate (A-2). This range is sufficiently broad to encompass almost any blend ratio of the polycarbonate species taught by Laughner 154.

With regard to Claim 7, Laughner '154 teaches that additives can be included improve the ignition resistance of the composition (See col 16 line 54), and suggests that these additives typically do not exceed 5% by weight of the composition (See col 17 line 2). Laughner '154 does not explicitly teach the addition of alkali metal salts. However other work by the same inventor, Laughner '686, in the same art, namely improving the quality of polycarbonate (or carbonate polymers compositions), teaches the incorporation of metal salts of sulfur compounds, such as aromatic sulfonates, sulfates, and others, where the cation is preferably an alkali metal. (See col 4 line 26-

59) Laughner '686 goes on to teach that the metal salt would preferably be included in amounts ranging from 0.001 to 2 percent, by weight, in order to provide resistance to the effects of burning. (See col 5 line 33-46) In both cases, the same inventor working in the same system presents polycarbonate compositions. The more recent art, Laughner '154, presents improvements to the polycarbonate composition, and glosses over the trivial additives, such as flame retardants, which are well known and well established in the art. The inventors own work, Laughner '686, from six years prior, presents these flame retardants, in a similar system (a polycarbonate in combination with a SAN copolymer and a impact modifier) (See abs). It would have been obvious, not only for one of ordinary skill in the art, but for this specific practitioner, to have made the combination of these well know elements with the improvements of the composition described in Laughner '154. Furthermore, it would have been obvious to one of ordinary skill in the art to incorporate the alkali metal salts in the composition of Laughner '154 in view of Meyer, in order to realize flame retardance provided by this known additive.

With regard to Claim 8, attention is first directed to the discussion of Claim 7 for the alkali metal salts and motivation. Laughner '686 teaches aromatic sulfonates where the cation is preferably an alkali metal. (See col 4 line 26-59). This is consistent with an alkali metal sulfonate.

With regard to Claim 11, Laughner 154 teaches samples prepared by injection molding. (col 17 line 29)

3. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Laughner et al. (US 5,369,154)** in view of **Laughner et al. (US 4,786,686)** and **Meyer et al. (US 2004/0030090)** and **Paul et al. (US 4,569,970)**

The discussion of **Laughner '154**, **Laughner '686**, and **Meyer**, above in **paragraph 5**, is incorporated here by reference.

With regard to Claim 4, Laughner teaches that a copolymer can be formed by reacting a carbonic acid derivative and a polydiorganosiloxane (See col 4 line 66-col 5 line 5) and directs the reader to Paul for a discussion of the generation of siloxane/carbonate block copolymers. (See col 5 line 3) Paul teaches a copolycarbonate containing 4.5% to 10% by weight of **polydimethylsiloxane**. (See Paul col 5 line 58- col 6 line 3) Laughner has explicitly directed the reader to these compounds, therefore it would be obvious to one of ordinary skill in the art to employ the copolymers of Paul in the invention of Laughner '154 in view of Laughner '686 and Meyer.

Response to Arguments

4. Applicant's arguments filed **7/21/2009** have been fully considered. Specifically, applicant argues **(A)** Claim 2 has been amended to recite a specific Markush group, **(B)** Claim 8 has been amended to recite "compound" rather than "monomer," **(C)** Applicant has submitted the Declaration of Mr. Mitsuhashi asserting the impact resistance and flame retardance of the claimed invention is "unexpected;" Specifically, the Mitsuhashi declaration demonstrates the preparation and evaluation of polycarbonate resin

compositions falling both inside and outside the scope of Applicant's Claim 1, and applicant alleges that this data shows that when the articles prepared fall within the scope of Claim 1, the obtained molded articles have excellent flame retardance and impact resistance, however polycarbonate compositions falling outside the scope of Claim 1 have inferior flame retardance and impact resistance; Furthermore applicant points out that Mr. Mitsuhashi, who has 19+ years in polymer chemistry research, specifically with polycarbonates, declares "this difference in impact resistance and flame retardance is unexpected," and constitutes objective evidence of the improvements of the polycarbonate resin of Claim 1 over known resin compositions, as in Meyer et al., Laughner et al., and Paul et al., and accordingly in view of this rebuttal evidence, applicant's request withdrawal of the obviousness rejections.

5. **With respect to argument (A)**, applicant's arguments have been considered and the 112 first paragraph rejection over **Claim 2** has been withdrawn *in light of applicant's amendment*. Support for the amendment in the specification at paragraph [0024] is acknowledged.

With respect to argument (B), applicant's arguments have been considered and the 112 first paragraph and second paragraph rejections over **Claim 8** has been withdrawn *in light of applicant's amendment* changing the word "monomer" to the word "compound." Although the word "compound" was never used in the specification, the sulfonated moieties recited are implicitly recognized as compounds, and therefore support is noted for this amendment.

With respect to argument (C), applicant's arguments have been considered and the prior art rejections of Laughner '154 and Meyer (Par 5, OA mailed 2/3/2009) and Laughner '154, Meyer and Paul (Par 6, OA mailed 2/3/3009), have been withdrawn ***in light of applicant's amendment***. A rejection over Laughner '154, Meyer, and Laughner '686 (See Par 7, OA mailed 2/3/2009), applying new grounds of rejection is set forth above, in paragraph 2.

With respect to the Mitsuhashi Declaration, it is first noted that the declaration is judged on the basis of fact, and not on the basis of conclusory statements. Thus, Instant Claim 1 requires a polycarbonate resin having dihydroxybiphenyl in an amount 5 to 50 mol%, an amorphous styrene resin in a ratio 50:50 to 95:5, talc from 1 to 20 parts, a core-shell elastomer from 1 to 15 parts, and PTFE from 0.1 to 2 parts. Example A and Comparative Examples A and B show no difference in the flame retardance, and the LOI differs by such a small amount that it is not clear that there is a statistically significant effect. With regard to the flexural modulus and the SFL, the data collected appears to fall between the data collected for the comparative examples falling outside of the required range, which would be expected when moving linearly along a range. With regard to HDT and Flexural Strength, it is not clear that there is a statistically significant difference in the data. Furthermore, it is noted that Example A is given a Not-V rating, which indicates that the flame retardance performance is below the rating scale for UL94. Therefore in order to achieve the unexpected results with the particular components demonstrated by applicant in this data, it appears that a second polycarbonate (A-2) is required, as only in the presence of a second polycarbonate and

other components is V-0 obtained. This suggests that Example 6 is the only inventive example which is in fact commensurate with the ***allegedly*** unexpected results (flame retardance and impact resistance) applicant discusses in the remarks. Therefore there are clearly parts of the claimed range, for example, the presented Example A, which do not show unexpected flame retardance results. In view of this single example, which has already been presented in the specification, it is the examiner's position that the data is not commensurate with the scope of the claims. Specifically, this shows an example at a very specific composition of 35 parts of a specific "other" polycarbonate, 50 parts of a specific dihydroxybiphenyl polycarbonate, 15 parts of an amorphous styrene, 10 parts of talc, 5 parts of a specific elastomer, and 0.5 parts of PTFE. However even if only Izod impact strength were considered, the presented examples are not commensurate with the scope of claims, as there is still a specific amount and type of the polycarbonate, amorphous styrene, and elastomer. This data represents a sample which is extremely narrow in scope, and therefore the data presented does not support the allegation that the instantly claimed invention overcomes the cited prior art on the grounds of unexpected results.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Darcy D. LaClair
Examiner
Art Unit 1796

/DDL/

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796